

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the reasons that follow.

A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

Claims 1, 3, and 5-19 are now pending in this application.

Rejection under 35 U.S.C. 102(e)

On page 2 of the Office Action, claims 1, 3, and 5-19 are rejected under 35 U.S.C. 102(e) as anticipated by U.S. Patent 6,703,307 (Lopatin et al). Applicants respectfully submit that Lopatin et al. is not available as a prior art reference against the claims of the present application.

A Declaration by the inventors pursuant to 37 C.F.R. § 1.131 has been provided herewith, which provides evidence that the subject matter recited in the pending claims was invented prior to the filing date of Lopatin et al.. According to the cover page of Lopatin et al., Lopatin et al. was filed on November 26, 2001, as U.S. Patent Application No. 09/994,358. The Declaration establishes that the subject matter recited in claims 1, 3, and 5-19 was conceived at least by August 21, 2001. Exhibit A attached to the Declaration includes an invention disclosure form that include drawings and statements establishing the invention of the subject matter recited in claims 1, 3, and 5-19 at least by August 21, 2001, which is before the November 26, 2001 filing date of Lopatin et al..

Accordingly, the rejection of claims 1, 3, and 5-19 should be withdrawn because Lopatin et al. is not available as prior art under 37 C.F.R. § 102(e) against such claims. Reconsideration and withdrawal of the rejections of claims 1, 3, and 5-19 under 35 U.S.C. § 102(e) is therefore respectfully requested.

On page 2 of the Office Action, claims 1, 3, and 5-14 are rejected under 35 U.S.C. 102(e) as anticipated by U.S. Patent 6,420,262 (Farrar). Applicant respectfully traverses the rejection. Farrar fails to disclose, suggest, or teach Applicant's invention as recited in claims 1, 3, and 5-14.

Claims 1, 3, and 5-9 require: “ion implanting elements into the seed layer, wherein the elements can be any one of Zn, Sn, Cr, Ca, Ag, and In, wherein ion implanting elements into the seed layer comprises low energy ion implanting elements into the seed layer.” Farrar does not show implanting elements into the seed layer, rather Farrar shows creating a seed layer by ion implantation. Col. 10, line 60 – Col. 11, line 9 of Farrar state:

FIG. 2D shows the semiconductor structure following the next sequence of processing. A first seed layer 216 is deposited on the inhibiting layer 214 using a low-energy ion implantation. In one embodiment, depositing the seed layer 216 on the inhibiting layer 214 includes depositing a copper seed layer 216. In one embodiment, depositing the seed layer 216 includes depositing copper seed layer 216 having a thickness of about 100 Angstroms. This can be achieved using an 8×10^{16} ion implantation of copper. In one embodiment, the energy of implantation includes about 100 electron-volts. Additionally, the copper seed layer 216 is implanted at an angle 215 normal to the planarized surface. Implanting the copper seed layer 216 at an angle normal to the planarized surface would result in the copper seed layer 216 being parallel to a bottom surface 218 in the trench 210. The copper seed layer 216 is deposited to a much lesser extent on the side surfaces 217 of the trench 210.

(underlining added.) Nowhere in Farrar is there any discussion or suggestion of implanting elements into the seed layer. The mention of Cr and Zr in Farrar (see Col. 9, lines 31-67) is in the forming of “inhibiting layer 214.” These elements referred to in Farrar are not implanted into a seed layer.

Claims 10-14 require: “providing an ultra-low energy ion implant of any one of Zn, Sn, Cr, Ca, Ag, and In to form a seed layer over the conformal layer, wherein ultra-low energy ion implant occurs at an energy level of 0.25 to 2.0 KeV.” As indicated above, Farrar only mentions Cr as a transition metal that can be used in the formation of the “inhibiting layer 214” and not a seed layer. Further, there is no mention of Zn, Sn, Ca, Ag, or In as implants in any layer by Farrar.

Accordingly, the rejection of claims 1, 3, and 5-14 under 35 U.S.C. 102(e) based on Farrar cannot be properly maintained. Applicant respectfully requests withdrawal of the rejection.

Double Patenting Rejection

On page 4 of the Office Action, claims 1, 3, and 5-19 are rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 1-22 of Lopatin et al., in view of Farrar.

As indicated above, Applicant respectfully submits that Lopatin et al. is not available as a prior art reference against the claims of the present application. Nevertheless, to ensure quick allowance of the pending claims, Applicant hereby submits a terminal disclaimer to overcome the double patenting rejection which Examiner can enter if the Declaration under 1.131 is not sufficient to overcome the rejection.

Applicant respectfully requests withdrawal of the rejection.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

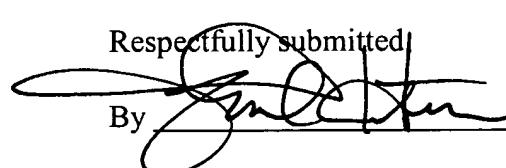
The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 50-2350. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 50-2350. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 50-2350.

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Respectfully submitted

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